

The Submarine Division of the Naval Safety Center Presents:



FLASH

Factual Lines About Submarine Hazards

March 2000 – June 2000

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Route for Safety Sake

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ENG _____	All DCPO _____	_____
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DECK _____	_____	_____
COB _____	_____	_____

Steam Suit Hose Lengths Extended

By MMCS(SS) Terry Fahringer

A message from Navy Clothing and Textile Research Facility, 062200Z OCT 99, authorized all submarines to connect multiple 25 foot EAB hoses together to construct up to 100 feet of hose for use with the steam suit. Although it is left up to the command as to whether they want to use multiple hoses or stay with one 25-foot hose, there are some definite advantages to the 100 feet of hose.

A steam suit protects the wearer by providing a layer of cool air between them and the suit. The suit is not airtight and is designed to have a constant flow of air. If the flow of air is stopped the suit will deflate. Once the suit is deflated the steam and gases will enter the suit and in a very short period of time burn the wearer. If you have 100 feet of hose, the wearer can hook the suit into a manifold inside the engine room and proceed to the different areas to perform the tasks required without disconnecting from the air supply. We received several calls asking if one, 100-foot hose can be used instead of four, 25-foot hoses. The message does not authorize that configuration. After talking with several commands using multiple hoses, we noted they have an advantage.

The Shrader fittings provide a pivot point and helps cut down on kinking the hose. Realizing that four hoses add several connection points that could fail, Shrader fittings are a reliable and positive locking connection that do not tend to disconnect unintentionally. It will take some additional training to become proficient with the added sections of hose to keep them from kinking or snagging. The hose assembly must be carried away from the suit so it does not press inflated parts of the suit against the body.

You can order the 25-foot hose authorized for use with the steam suit using **NSN 4240-01-377-6288**. Steam suit hoses are required to have a metal tag attached stating "FOR STEAM SUIT USE ONLY." This tag must be on each section of hose so personnel will not remove the hoses from the steam suit location and use them elsewhere. The last thing you want to be doing is looking for hoses to use on the steam suit when a real steam leak occurs. The message indicates that NSTM Ch. 077 and other applicable documentation are being revised to reflect the authorization of the use of the steam suit with up to 100 feet of EAB hose.

! Alert !! Alert !! Alert !

If you have had a problem with your pyro flood valve in the last two (2) years; e.g. the valve is leaking by, water at the telltale, flood valve recently repaired or scheduled for repair, please contact MMC Gallenstein by phone or E-mail (see page 1). I need your information to pass to NAVSEA. See COMNAVSAFECEN Afloat Safety Advisory 6-00

It Looks Good; but, Is This Really Authorized?

By MMCM (SS) John Mosholder

On a recent survey, I noticed the ship had procured dark gray flash hoods for their OBAs. The hoods were purchased from a local civilian vendor at a substantially reduced price. The problem with procuring equipment this way is that it might not have been tested sufficiently or may not meet the requirements for use in a military application. In this case, the hoods the ship procured will not provide adequate protection for someone fighting a fire in an enclosed space nor were they designed to. The only flash hoods currently authorized for use in submarines are listed in the appropriate APLs and can be ordered using NSN 9D 8415-01-462-7670 for OBAs and FFEs or NSN 9D 8415-01-268-3473 for EABs.

On another ship, I noticed that all the AFFF fire extinguishers had been outfitted with brand new foot stands. I asked the DCPO how

he managed to replace them and he told me that he had simply broken the mushroom shaped piece of metal (technically called the bayonet) off the bottom of the extinguisher shell and glued the new foot stand in place. NAVSEA, NAVSESS and AMEREX (the manufacturer) all disapprove of this process. AMEREX went so far as to say that removing the bayonet affects the structural integrity of the extinguisher shell requiring the extinguisher to be hydrostatically tested or replaced.

Before making any deviations from approved equipment or procedures it pays to bounce your ideas off the appropriate people first. In both these cases, the ships thought they were saving money; but, in the long run it will cost them more to correct the situation.

Would you Survive II

FTC (SS) Jay Bramble

In the last issue of FLASH, I spoke very briefly on how to increase your survival time if your boat submerges for the last time. COMSUBGRU 5 provided some theory about this issue.

While the most likely scenario for a DISSUB (disabled submarine) is flooding in the engine room, the real reason for moving the LiOH canisters forward is to maximize the survival time for the persons in the forward compartment until rescue arrives. If flooding is in the forward compartment, the sheer size

and volume of air contained in the engine room allows a normal under way watch team (plus a couple of extras) of about 16 to survive for greater than 7 days with out **any** LiOH. If flooding was aft, all 150 canisters are needed to provide the minimum 3 days of survival time for the survivors in the forward compartment.

Since the volumetric size of the forward compartment is small (compared to the engine room) and the number of personnel in it is likely to be high, this is the real reason for moving all canisters forward.

Square Can Opener

HMCS(SS) Bret Darnell

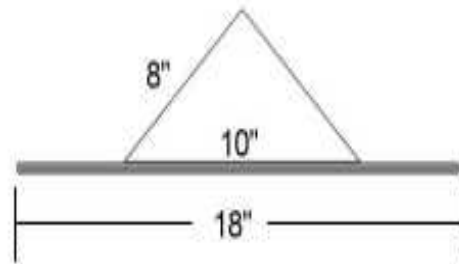
If it's happened once, it's happened a thousand times. An MS or FSA has to open a large can of coffee or sugar (you know, the ones that are impossible to open with a can opener because of their square or non-circular shape). He uses a knife or a dough cutter, something with a point and a straight edge to cut along the top of the can and remove the lid. In the process he creates a serrated edge along the inside lip of the can and on the lid that he's just removed. A DOUBLE opportunity for him (or another cook) to cut himself on one of the jagged edges.

Have you ever wondered why they don't just make the cans round or why there isn't a can opener that will open those square top cans? We may not be able to change the shape of the cans, but, we can come up with a better way to open them.



During a visit to USS Norfolk (SSN 714), our submarine survey team was introduced to a tool that has enabled their cooks to all but eliminate the lacerations that result from

improperly opened cans. It's a very simple device, with no moving parts. Although it looks sort of evil, it's perfectly harmless. The edges and the point are not sharp enough to cut someone, but when you place its point on the edge of a can lid and apply a little body weight, it cuts through the lid like a hot knife through butter. And as it cuts, the edges of the can are turned downward. The lid edges are turned



downward, as well, but it should be handled with care (with cut resistant gloves) until disposed of safely.

The best news about this tool is that you can make it yourself (or have it made for you). The USS Norfolk used a round stainless steel 3/4 inch bar stock for the 'spine' (approximately 18 inches long). The stainless allows you to easily keep it clean and sanitized. The triangle at the base where it is spot welded onto the spine is the width of the side of the square can (approximately 10 inches). The material is 4 or 6-gauge stainless steel.

Float Line Lines

FTC(SS) Jay Bramble

The first impression any visitor gets of your ship is the appearance of topside. If topside is squared away, the ship is probably squared away; if topside is a mess.... Well, you get the picture. One of the most visible items topside is the floating lifeline. On several recent surveys, we have noticed poorly maintained or missing lines. This item has also been a common deficiency on several recent INSURV inspections.

Many submarines have called for information on construction criteria and supply procedures to order the floats. Many of you do not have **NAVSEA Dwg 804-5000915 Rev A** onboard, which describes floating lifeline construction specifications. **NAVSEA Dwg 804-5000915 Rev A** (quoted below) states:

The floating lifeline system provides a means for man overboard recovery while moored or pierside, by allowing an individual to pull himself along the lifeline and regain access to the ship via the stern or the Jacob's ladder. The floating lifeline system shall **consist of port and starboard assemblies** of floating rope and encapsulated air buoys, which are rigged when moored or pierside.

Each buoy shall provide minimum buoyancy of 10 pounds when fully submerged in salt water. The ends of each assembly shall be secured to the forward most and aftermost cleat or chock (if chock is located on the ship centerline). The assembly shall be provided with enough slack so that the line will float clear of the hull. The length (L) of each assembly shall be equal to the distance between the floating lifeline forward and after attachment points (D) multiplied by a factor of 1.05, plus 25 feet; that is $L=(1.05 \times D)+25$. For ease of handling

and stowage, each assembly shall be constructed in segments, which contain no more than 14 buoys each. Segments shall be joined when deployed using the midspan connection show in Figure 1.

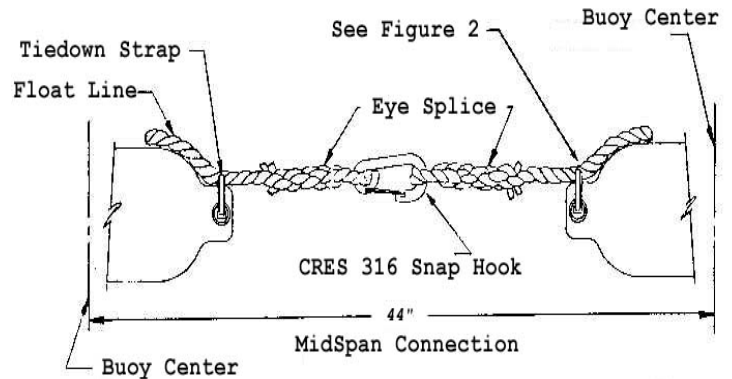


Figure 1

44"

The first buoy at each end of the port and starboard assemblies shall be located where the floating lifeline enters the water. Buoys shall be spaced a maximum of 68 inches on centers, except at the midspan connection where spacing shall be a maximum of 44 inches on centers. Buoy attachment shall be as shown in Figure's 2 and 3.

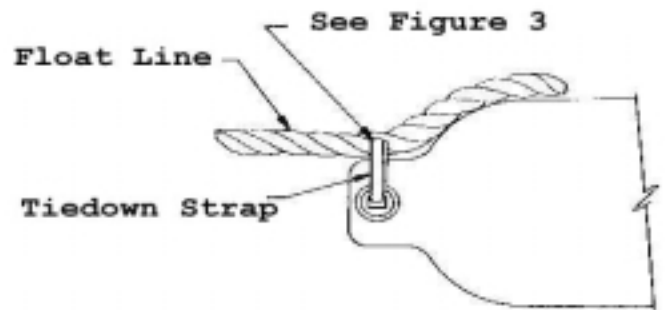


Figure 2

"Lifeline segments shall be stowed in the pressure hull access trunks in laundry bags. The stowage location shall not interfere with hatch operation or with normal passage of personnel through the trunk."

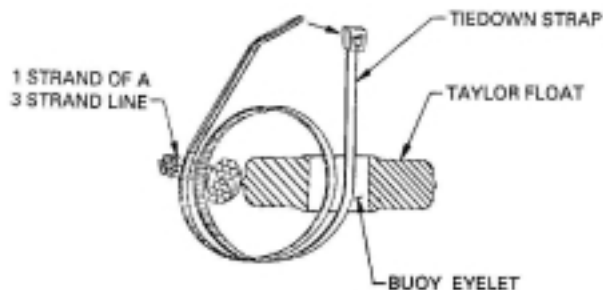


Figure 3

Figure 1 on previous page shows an example of floating lifeline construction. If the straight-line distance between the forward and after attachment points is 200 feet, each assembly is 235 feet $(1.05 \times 200) + 25$. Notice the floats are 68 inches on center except at the midspan connection (Figure 1). There, they are 44 inches on center. In Figure's 2 and 3, you can see how to wrap the tie down strap around two

strands of the floating line. Feed it through the line twice.

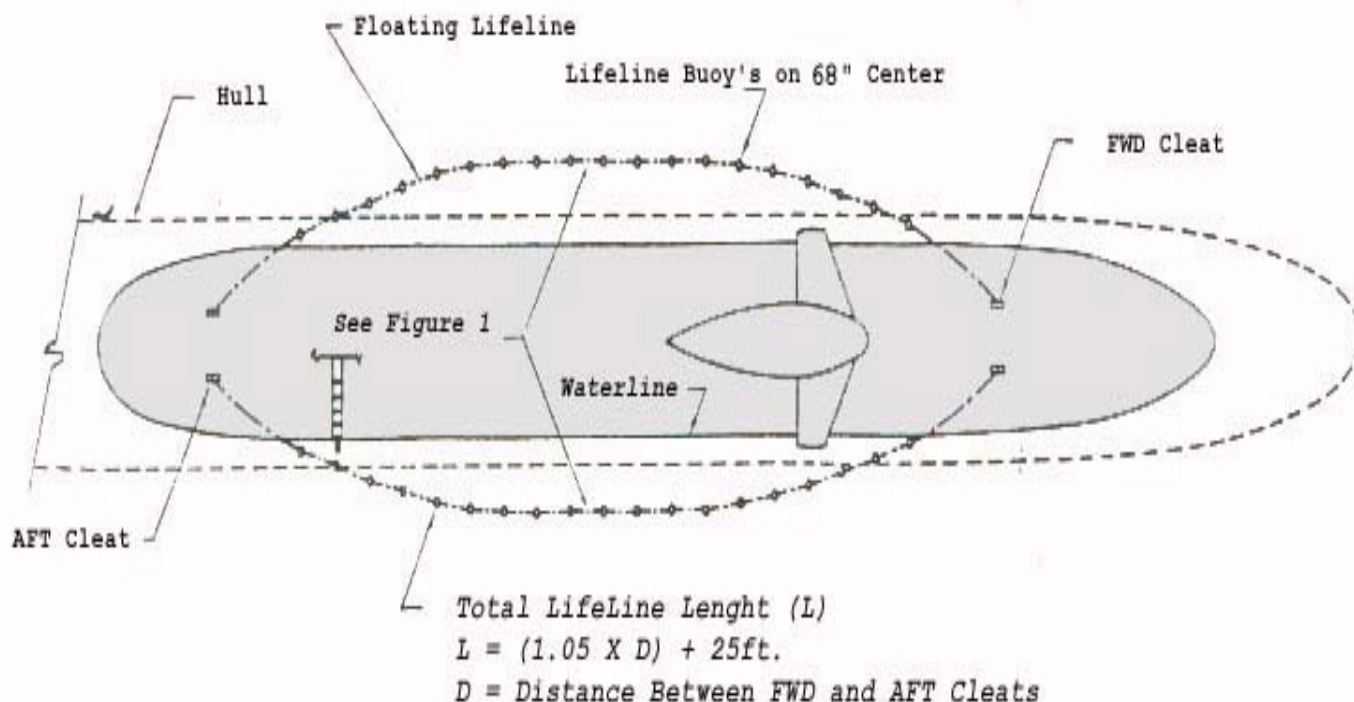
The materials required for construction are:

Polyethylene line, yellow NSN 4020-00-968-1351
Strap, tie down, electrical 5975-00-899-4606
Snap hook, CRES 316 5340-01-282-5661

5 1/2 x 20 inch floats are available by open purchase through mariner suppliers. With the procedure and the correct materials, you can construct a set of floating lifelines that work well, look sharp, and are easy to handle and store.

Reference: (a) NAVSEA Dwg 804-5000915
Rev A

Figure 4



Pyrotechnic Mishap

MMC (SS) Gallenstein

A unit in the Atlantic fleet had an explosive mishap causing major damage to the forward signal ejector. The ship was at test depth, preparing to hand-ram a combination flare from the forward signal ejector. While flooding and equalizing the signal ejector, the device detonated with enough force to be felt through out the ship. Surprised? Consider this.



The 12 bolts attaching the muzzle ball-valve assembly to the barrel sheared. The fairing over the muzzle ball-valve assembly was bowed outward away from the pressure hull. The barrel was split open. The gasket on the breech failed and allowed sea water to enter the bow compartment with the ship at test depth. All of this from a pyrotechnic!



Which pyrotechnic?

The MK-120 Mod 1. Green Combination Flare

Fortunately there were no injuries as a result of this mishap. The ship immediately proceeded shallow, surfaced and returned to port.

Investigation into this explosive mishap and repairs to the signal ejector are in progress.

Because of the mishap, **NALC L259, Mk-120 Mod 0, Lot number CRA89B001M001A** has been reclassified to condition code **J** by **NAR 0419-00** and **Lot number CRA89B001M001B** has been reclassified to condition code **J** by **NAR 0420-00** also.

Initially, NARs were released for the Mod 0. We have verified that they are specifically for the Mod 1. This was caused by a problem with the device "nomenclature data" at Mechanicsburg. However, they issued a correction in April.

Condition code J means Suspended from use.

As a reminder, when reviewing NARs, besides looking at the NALC, MK and Mod numbers, make sure you **check Lot numbers** and any stock numbers if included.

Information and drawings for the Mod 0 are in SW050-AB-MMA-020. For the Mod 1, refer to SW050-AB-MMA-010.

A brief history of the Mk-120 Mod 0 and 1.

- 1985, a device detonated while undergoing testing at a shore facility.
- 1986, a device detonated while being loaded for launch.
- 1992, a device failed to leave the launcher during launch, detonated in the barrel, and injured 2 sailors.

- NAR 0135-94 changed the condition code to F, *Unservicable Repairable* for NSN 1370-01-045-0477.
- NAR 0308-00 changed the condition code to H, *Unservicable Condemned* for NSN 1370-01-045-0477. This NAR supercedes 0135-94. Listed on the NAR as Mod 0.
- NAR 0309-00 changed the condition code to H, *Unservicable Condemned* for NSN 1370-01-398-6912. Listed on the NAR as Mod 0. This is the NSN for the Mod 1.
- NAR 0310-00 changed the condition code to B, *Servicable with Qualifications* for specific Lot numbers. Listed on the NAR as Mod 0, but the Lot numbers are for Mod 1.
- March 2000, the explosive mishap described in this article, followed by,
- NAR 0419-00 and NAR 0420-00 changing the condition code to J, *Suspended from Use*, for the Mod 0, not the Mod 1.
- April 2000, a correction to NARs 0419-00 and 0420-00 was released to include Mods 0 and 1.
- April 2000, with all the confusion over the condition codes, lot numbers and the cause of this mishap, COMSUBLANT and

COMSUBPAC released a joint message 032207Z Apr 00, to **suspend ALL use of the MK-120 until further notice.**

Is the Mk-120 the only problem?

While preparing this article, I looked back over 10 years worth of data on submarine pyrotechnics.

- 5/1987, a Mk-117 inadvertently launched at a shore facility while preparing the device for testing.
- 10/1999, a MK-117 ignited in the barrel during launch and failed to leave the launcher.

These are the only other explosive mishaps involving submarine pyrotechnics that have been reported.

Replace your MK-5s (AIULP)

FTC(SS) Jay Bramble

Did you know the MK-5 floatcoat has been discontinued and **ALL PARTS AND MAINTENANCE SUPPORT WILL BE PHASED OUT IN LESS THAN 2 YEARS.** The NAVSEA message 050320Z NOV 97 instructs you use the MK-5 until uneconomical to repair, then replace your MK-5s with MK-1s. The MIP number for the MK-1 is 5832/002-10. The AEL numbers are 2-330013101 and 2-330014161 through 2-330014166.

Another tip:

You **can** get different color covers for the life preservers. Why not do what the carrier fight deck crews do. Use a different color for each position topside. E.g. white for line safety persons, red for the XO, blue for line handlers, or use your own color scheme, you get the idea.



Bilge Lighting

ETC (SS) Dave Therre

On a recent survey trip, I discovered that many submarines are utilizing extra permanent lighting fixtures in a hazardous way to illuminate the engine room bilge areas in an effort to enhance cleanliness.

The most common means of illumination were fluorescent lights fastened (using plastic tie-wraps) to pipes, hangers, or something in the bilge and the cable modified with a three-prong plug. The other was a drop light fastened in the same manner. Lights were plugged into isolation receptacles along the way. Cables were wrapped several times around the pipes or hangers to keep from hanging in the bilge and most were tie-wrapped.

Don't misunderstand, efforts to get the bilge areas cleaner are applauded, but there are some safety issues to consider.

NSTM ch. 330-1.9.2.26 states that, "only extension lights that are authorized for shipboard use by NAVSEA should be used aboard ship in order to eliminate or drastically reduce the many hazards associated by the use of randomly selected unauthorized lights."

NSTM ch. 330-1.9.2.27 discusses the four types of explosion-proof and watertight extension lights that are authorized (meeting standard 3-foot submergence test) for shipboard use in a Class 1 location (flammable gases are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures).

Portable extension lights are designed to be portable and not fastened as in a permanent way.

Submarines are designed with two lighting systems, ac and dc ship lighting systems (**NSTM 330-1.6.2.2**). Watertight fixtures are installed in the battery, machinery, and reactor spaces. A submersible fixture, lighting symbol number 174.4 is provided in the access and escape trunks. (**NSTM 330.1.6.2.4**). The fluorescent light found in the overheads of submarines does not satisfy this requirement.

***ORM may have prevented
this bad day of ship
driving.....***



Flex Hoses

MMC(SS) Gallenstein

The topic of flex hoses has become a concern for many submarines in recent days. Based on fleet surveys, each ship has a flex hose program. However, the program varies from ship to ship. This article is the first of a series to provide guidance for every submarine, to establish a fleet standard and to improve the ship's capability to maintain flex hoses.

First, ensure documentation is current onboard your ship. The tech manual is NAVSEA S6430-AE-TED-010, "Technical Directive For Piping Devices and Flexible Hose Assemblies"; Second Revision, 15 July 1996. Several advanced change notices (ACNs) have been issued to the technical directive, including:

1. ACN 3/A issued 10 Dec 97 modified the criteria for determining criticality and extending the periodic replacement requirements. Critical hose assembly replacement limit is extended to 12 years maximum. Non-critical hose assemblies have no periodic replacement limit and are allowed to remain in service until they fail annual visual inspection or fail in service. **Note: This ACN is not effective until hose criticality is reviewed and authorized by NAVSEA PMS 392.**

2. ACN 1/A issued 10 Sep 98 provided guidance on lagging with respect to hose inspection and hose fabrication containing beryllium-copper support coils.

3. ACN 2/A (not yet issued) will provide additional guidance for PTFE (Teflon) hoses and add an exception concerning repair capability of ship's force when determining criticality of rubber hose.

To date, NAVSEA PMS 392 has determined criticality for the SSN 688 class submarines. Your Type Commanders and squadrons have the documentation. The SSN 688 class planning

yard, Newport News Shipbuilding, issued RLAR 13601 documenting all flex hoses including critical and non-critical rubber flex hoses. NNS will provide LAR distribution to all SSN 688 class submarines.

Due to the complexity of SSN 688 class configuration, each work center that has systems/components with flex hoses is recommended to use the class RLAR to update or develop an equipment guide list (EGL) listing every flex hose for that work center.

Each ship has a selected record drawing (SRD) specific to flexible connections, however, in many cases, this particular SRD may or may not be current with ship's configuration. Each work center should accomplish pen and ink changes to the SRD to ensure all flexible connections are identified. Once all flex hoses are identified, ensure respective PMS is scheduled and accomplished accordingly.

Because the flex hose SRD is revised to reflect replacement, material changes, etc., NAVSEA is currently investigating the feasibility to replace the SSN 688 class flex connection SRD with an automated flexible connection database. For SSBN 726 class, an electronic database already replaced the ship SRDs.

NAVSEA is currently reviewing flex hose criticality for the SSBN 726 class, estimated completion date, end of summer. In 2001, NAVSEA will initiate the reviews of SSN 21 class submarines. For all other submarines, NAVSEA has concluded it is not cost effective to determine criticality.

The technical requirements will not be revised, all hoses will be replaced as required by existing documentation and established periodicity's.

Submarine POC is NAVSEA 92T, Jill Chopak-Mueller, Comm:703-602-8096, Ext. 420 or DSN 332-8096, Ext. 420.

Flex hose life cycle manager is PSNSY code 260.1LCM, Harry Hibler, Comm: 360-476-1961 or DSN 439-1961.

Next article ...flex hose identification, replacement of flex hoses during availability's, etc.

Ammo/Pyrotechnic Thermometers

MMC(SS) Gallenstein

OP-4 Rev 6, Ammunition Afloat, requires the use of the -40° to 180° thermometers, with min/max indicators, on the ammunition and pyrotechnic lockers. Most submarines have the 20° to 240° thermometers installed. These thermometers **are acceptable** (NavSea letter Ser 03W1/068, dated April 1994) and may be used on submarines. This will be included in a future change to OP-4. Expect it late this year (Sept00).

For thermometers with 4" stems:

The correct NSN for the -40° to 180° thermometers is **6685-00-042-3218** Part number E318A4R3. The correct NSN for the

20° to 240° thermometers is **6685-00-404-3715** Part number E324A4R3.

We have seen some locker designs that will not permit the 4" -stem thermometers to be used. Do not cut off the thermometer well to make room for the stem!

To order thermometers with 2" stems, -40° to 180°, use NSN **6685-01-216-7147**. I have not been able to locate a thermometer with a 2"-stem in the 20° to 240° degree ranges, but I'm still looking.

The specific requirement and MIL spec are spelled out in OP-4 Rev 6, paragraph 5-4-1.e.

Also, the required calibration on these thermometers has been changed to 3 years.

Hail and Farewell

We want to welcome aboard **LCDR Parker Swan**. LCDR Swan reported to the Submarine section as one of our senior surveyors. He comes to us from USS FRANK CABLE (AS-40) homeported in Guam.

Previous duty stations include USS ORTOLAN (ASR-22), USS ALAMOGORDO (ARDM-2), USS PROTEUS (AS-19), CSS-18 PMT, USS GRAYLING (SSN-646), USS JOHN C CALHOUN (SSBN-630), S5G PROTOTYPE and USS JAMES MONROE (SSBN-622). LCDR Swan may be reached at (757)444-3520, Ext.

7201 (DSN prefix 564), or email him at pswan@safetycenter.navy.mil

We bid a fond farewell to **MMCS(SS) Terry Fahringer** (soon to be **CWO2 Fahringer**) after three years as a submarine safety analyst. He served as the expert in submarine damage control equipment and as the FLASH editor. He has conducted over 1200 hours of expert training and spearheaded safety issues throughout the fleet. He reports to the *Damage Control Assistant* school in Newport, RI then on to the USS Emory S. Land (AS-39) as the A-Division officer.

Effective COMNAVSAFECEN Afloat Safety Advisories

Year 2000

30B 1-00 051231Z JAN 00 Effective COMNAVAFECEN Afloat Safety Advisories for Surface Ships and Submarines

343 2-00 101334Z JAN 00 Auto-Inflatable Life Preservers Mk-1 And Auto-Inflatable Utility Life Preserver Mk-5 Mod 0

392 4-00 061120Z APR 00 COMNAVSAFECEN Security Clearance Information

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USE
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